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ORGANIZING FOR AGRICULTURAL DEVELOPMENT

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ORGANIZING FOR AGRICULTURAL DEVELOPMENT

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Introduction

1. There are two crucial points requiring attention in organizing for agricultural development. One is the individual farm or holding. The other is the wider economy as it affects agriculture.

2. This paper will be primarily concerned with the first of these, with emphasis upon those aspects of organization that bear most immediately upon the production decisions of farm operators. Attention will be focused upon the kinds of jobs that need to be done if substantial and sustained increases in agricultural production are to be achieved and the more difficult problems of organizing to do them. Scant attention will be given to forms of organization or to administration.

3. Back of those activities that have an immediate bearing upon farmers' production decisions are a host of supporting activities in the wider economy that are essential to agricultural development -- provision of transportation networks; general and technical education; health facilities; appropriate patterns of land settlement, tenure and tenancy; irrigation facilities; appropriate tax, credit, fiscal and monetary policies; and many others. Although each of these influence agricultural development, directly or indirectly, and to a greater or less extent, because of space limitations we shall do no more in this paper than recognize their importance. We shall concentrate on what seems to us to be the central problem of organizing for agricultural development, namely, broadening and making attractive the alternatives available to each farm operator in the direction of increasing farm output.

Basic Considerations in Organizing for Agricultural Development

4. Agricultural production is not a mechanical process but one of facilitating biological growth under almost infinitely varying conditions. It is very different from factory production in which it is possible to control within narrow limits the quality and quantity of each input and the environment in which the production process takes place to produce, day in and day out, a highly standardized product in predetermined amounts. Instead, agriculture is carried on in varying climates under fluctuating weather conditions, drawing upon variable supplies of plant nutrients and soil moisture, using crop varieties of differing genetic potential and with crops and livestock subject to diseases, pests and other hazards.

5. On most of the cultivated lands of the earth, there are variations in soils, available plant nutrients, soil-water relationships, and sunlight, air and soil temperatures during the growing season, not only among regions and areas within regions but in greater or less degree from farm to farm, field to field, and even within fields. The north and south slopes of a single hill may be best adapted to different crops or require a different set of production practices for best results. The intricate pattern of land use on individual farms in Japan illustrates close adjustment of agricultural production to microdifferences in factors affecting plant

growth. Fields at different distances from villages in North India currently differ widely in soil fertility. They are planted to different crops and cultivated with differing intensity.

6. Thus, it is characteristic of the production process in agriculture that, in technical terms, the quality and quantity of most inputs is variable and joint costs and joint products are more characteristic than in many types of industrial production.

7. What this means for agricultural development is that standardized recommendations for wide areas of agricultural land are seldom if ever justified. Instead, the essence of maximizing agricultural production is to find the best use for individual fields and plots, modifying each in such ways as are necessary and economically feasible to increase the quantity and improve the quality of the product.

8. Although the basic process in agriculture is the management of biological growth, agricultural production is an economic activity. In societies in which the farm operator (whether owner, tenant or hired manager) makes production decisions the individual farm or holding is the unit for which costs and returns must be compared whether in monetary or non-monetary terms. It may be that the real cost of using a new production technique is decreased leisure or lowered social status if the cultivator is considered by his neighbors to have violated his role in society by breaking a long-established tradition. An increased harvest does not constitute increased income if the cultivator is forced by social custom to share it through feasting or to support relatives rather than being allowed by local custom to sell it. Or an increased harvest, beyond family and local needs, may not represent increased returns if there is not a market for it at a remunerative price.

9. The key to agricultural development is to make it possible and attractive for the operator of each farm or holding to change practices in ways that will increase production on a sustained basis. It is on the alternative combinations of practices available to the individual operator and the potential rewards associated with these alternatives that attention must be focused if substantial and sustained agricultural development is to be achieved.

10. It is important to recognize, and never forget, that agriculture is an activity of human beings, of people. No matter what the form of social or economic organization, it is people who make decisions about the management of farms, who learn new skills, adopt new practices, till the land and manage the livestock. They provide the labor but they are much more than laborers. They are human beings -- individuals -- who at the same time are members of communities, societies and cultures and who derive much of their satisfaction in life from the degree to which they are accepted, respected and loved within those groups.

11. In organizing for agricultural development we are trying to encourage and facilitate such behavior by men and women as will result in their producing more agricultural products while recognizing and respecting the fact that few of them are interested in production for the sake of production but only as it serves ultimate values and goals held by them or by the social groups of which they are members.

12. In this era of national planning, we have grown accustomed to thinking in national terms and national programs. This is important and has its place. But we must never allow the national view, important as it is, to cause us to overlook those characteristics of agriculture that make imperative effective local integration of efforts to increase production and substantial adaptation of development programs to meet varying sets of local conditions.

13. What has been said applies almost equally in regions where agriculture is still largely traditional, in regions where it is in the transitional stage of development,

and in places where agriculture has entered the commercial stage. In the remainder of our paper, however, we shall center our attention on organizing for agricultural development at the early transitional stage. This stage has two important characteristics: First, it is the stage in which farmers' decisions are based less and less upon tradition and more and more upon rational choice from among alternatives. Second, it is the stage when more and more purchased requisites are used in agricultural production.

14. If, at the early transitional stage, a program to increase agricultural production is to be successful, effective organization and follow-through is essential in three areas:

(a) First, provision must be made for developing locally-tested combinations of improved practices which, if adopted by farmers, will increase production on their farms;

(b) Second, production supplies and equipment of the kinds and quality farmers must have if they are to put recommended combinations of practices into effect must be locally available when needed;

(c) Third, individual farmers must be convinced that the recommended practices will in fact increase production on their farms and that it is to their advantage to adopt them.

Activities in these three areas must be carefully coordinated in a single, integrated program if sustained development at a satisfactory rate is to be achieved.

Locally Tested Combinations of Practices

15. Economic increases in agricultural production seldom result from the adoption of a single improved practice. Substantial and sustainable increases in agricultural production usually depend upon the use of a combination of improved practices including use of improved crop varieties; use of chemical fertilizers and other measures to insure an adequate and balanced supply of available plant nutrients; practices designed to provide suitable water-air relationships in the soil; and plant protection measures.

16. Since there are usually significant variations among farms, and even among the fields of a single farm, in soils, topography, available supplies of plant nutrients, water relations, air and soil temperature, sunlight, etc., it follows that not one but many different combinations of "inputs" must be used in a single community and even on different fields of a single farm if returns from land, labor, purchased requisites and other factors are to be maximized. Seldom, if ever, is a single set of recommended practices suitable for use without adjustment throughout an area of appreciable size. Such a set of "standard" recommendations is like the Army uniforms in World War I were said to be, designed to fit the "average" man with the result that they were too big for half the Army and too small for the other half. There is, of course, a limit to the number of sizes of clothing it is feasible to manufacture, whether for soldiers or civilians. The individual either has to be satisfied with an "approximate fit" or get a local tailor to make the necessary adjustments. So it is with agricultural practices. Even the recommended practices that constitute the "best fit" for a particular farm usually require some adjustment if the best results are to be obtained, especially when economic considerations and the operator's management capabilities and financial position are taken into account.

17. A large body of scientific and technical knowledge exists that makes possible the development of locally-adapted practices that, if properly applied, will increase agricultural production by substantial amounts in the developing countries. Unfortunately, political leaders, government administrators and members of the public with little knowledge of agriculture sometimes fail to distinguish between this general body of

knowledge and its application to specific situations. The scientific principles and the art of plant breeding are highly developed. It may still remain to apply the principles and the art to the development of varieties of wheat, corn or rice suited to particular conditions of soil, climate, consumer tastes, etc.

18. It should not be overlooked that even in countries with highly developed programs of agricultural research, while some research workers are adding their bit to the world's store of basic knowledge, by far the greater number are engaged in applying known principles to the solution of local problems. They are engaged in trying to develop improved practices that, when appropriately combined, will better meet the needs of farmers in particular situations.

19. Few newly developing countries have the necessary financial resources or trained personnel to develop a full-fledged system of central laboratories and research stations, experimental farms and demonstration fields within a short span of years. Too often under such circumstances the tendency is to establish central laboratories and research stations to which the scientific staff retreat, there to engage in long-term station-based research when the pressing need is for field studies and diagnosis of key problems retarding agricultural development and for scientific and technical work designed to find solutions to them. Laboratory and central station research is needed in developing countries. The question, however, is not whether such research is needed but how to make the best use of limited scientific and technical personnel and other scarce resources in the early stages of transition from a traditional toward a more highly commercialized agriculture.

20. Field trials and test demonstrations supervised and evaluated by research scientists have two special advantages at this stage. First, they take research scientists into the field where they come into direct contact with production problems, members of the agricultural advisory staff and practicing farmers. This usually proves useful all around, particularly in providing for the kind of "feedback" to central research stations and laboratories that is necessary if successive roadblocks to increased production are to be systematically attacked as they appear. Second, observation of local field trials and test demonstrations by farmers can play an important role in their developing a rational scientific attitude toward farming. In observing local testing and field trials farmers may learn the basic steps of observation, measurement, comparison of results and drawing of conclusions that are the fundamentals of rational thinking and science-based agriculture.

Production Requisites

21. Efficient and timely production and distribution of the requisites of agricultural production is a basic requirement in the shift from a traditional toward a commercial agriculture. This is too often overlooked in the early years of the transitional stage and too little effort and too few resources devoted to the manufacture (or importation) of the production supplies and equipment required by a changing agriculture. The first requirement is to get "requisites" (purchased equipment and supplies) of the required kind and quality produced or imported. This must be followed by measures to improve distribution, reduce costs, and assure the quality of the product as it reaches the farmer.

22. The purchasable inputs or requisites of agricultural production fall into four principal groups: (1) improved seeds; (2) fertilizers; (3) pesticides; and (4) implements, handtools and sources of mechanical power. Seeds better than those now in use by most farmers are already available locally in many places. In traditional and early transitional agriculture, there is considerable variation in the productivity of seeds customarily sown by different farmers. In addition, few farmers systematically collect, save and use the best of their own seed. Consequently, the first and easiest step in the provision of better seed is to find the best of the seeds already

in use in each locality and to introduce more systematic seed selection and storage by individual farm operators.

Production

23. All production requisites other than seeds -- fertilizers, pesticides, implements and tools, and sources of mechanical power -- must be manufactured. They differ, however, in whether they can be manufactured locally, using present technology; whether they can be efficiently manufactured in many small, widely scattered plants using new technology; or whether they can be efficiently manufactured only in centralized plants of large capacity. Improved implements and tools often can be manufactured locally by rural artisans using present technology. Some pesticides, and many tools and implements, can be manufactured in small-scale plants using new technology. Fertilizers ordinarily require large-scale manufacture in centralized plants if the operation is to be efficient.

24. Only two of the four principal classes of requisites needed for increased agricultural production, namely, fertilizers and pesticides, may require substantial amounts of foreign exchange to finance imports at the beginning of a program for agricultural development. These requisites are so important to agricultural development that sufficient foreign exchange should be made available to import as much of each as farm operators are ready to buy. The great importance of fertilizers and pesticides, and the demand their importation places on available foreign exchange means that the establishing of fertilizer and pesticide manufacture should have high priority in plans for industrialization in every country of substantial size in which agriculture is a major industry.

25. The provision of improved seeds normally will make very little demand on foreign exchange. Implements, tools and sources of mechanical power can make high demands on foreign exchange if allowed to do so but in most cases a country is better advised in the early stages of development to use the implements, tools and sources of power it can produce domestically. There are, of course, exceptions to this general statement.

Salability

26. Production requisites have four qualities inherent in themselves that significantly affect salability to farm operators: (1) technical effectiveness; (2) dependability as to quality; (3) availability when needed; and (4) price. When farm operators fail to purchase requisites in "planned" amounts, officials, administrators and others frequently explain the failure in terms of the "backwardness" or "conservatism" of farmers or because of "lack of credit." These factors may be involved but before passing such judgments it is important first to examine what was offered and on what terms.

27. The first quality a requisite must have to be salable is technical effectiveness. Is the "improved" seed really better? Too often, yield per acre at the central research station has been the principal factor taken into account in recommending its use. Unless the seed has been locally tested, differences in soils, available supplies of plant nutrients, water relations and microclimates may be such that the "improved" seed yields little or no more than varieties already in common use. If the growing season is significantly different from that at the central station where the new variety was developed, its use may expose the farmer's crop to greater than normal danger of damage by frost, disease, insects or birds because it ripens at a different time than local varieties. If the crop is used chiefly for local consumption, the taste or cooking quality may be sufficiently different to make it unpopular. In the case of fertilizers, differences in local soils, unless adjusted for, may result in yields quite different from those obtained on the central experimental farm.

28. Whatever the causes for local differences in technical effectiveness, only carefully planned and supervised local testing can assure that requisites recommended and

offered for sale really represent increased production opportunities.

29. A second influence affecting salability is the purchaser's confidence in the genuineness and purity of the item offered. Even tools and implements of inferior quality are not easily identified in the market place. For this reason, a prime requirement to widespread and repeated purchase of production requisites is sufficiently careful control of quality at all steps in the production and distribution process that farm operators develop confidence in their sources of supply.

30. The third factor affecting the salability of requisites is availability when needed. If a particular crop must be sown in early April, improved seed that arrives at the local distribution center on April 20th is useless and will go unsold since farm operators have already had to make other arrangements. If the seed is to be treated before sowing to control disease, the fungicide will also go unsold. In most agricultural operations, timing within a relatively narrow range has an important effect on yields and for requisites to be useful, and therefore salable to farm operators, they must be available when needed.

31. The fourth factor affecting salability of requisites to farm operators is price. It is important, but it is perhaps the least important of the four. Even a low price will not attract purchasers if the requisite is not technically effective, if its quality is uncertain, or if it is not available when needed. On the other hand, farmers have again and again demonstrated their readiness to pay premium prices for requisites that are effective, of reliable quality, and available on time.

Distribution

32. In a number of developing countries, arranging for the production and distribution of production requisites has proved to be a major bottleneck in programs to increase agricultural output. Even when the necessary requisites have been imported or manufactured domestically, existing facilities have not been geared to the job of distribution.

33. In practically every newly developing country, private commercial channels for the marketing in local areas of many articles in wide demand are already well established. However, because of the widespread, largely untested assumption that distribution through private merchants is more costly and less efficient than through governmental or cooperative agencies, the usual pattern is to set up new agencies to distribute production requisites. It would seem justifiable to recognize that the present merchants comprise a pool of experienced, trained manpower no less than do the present cultivators of land. It would appear, therefore, that advisory services in newly developing countries to help present merchants introduce the changes necessary to make the distribution of agricultural production requisites efficient and satisfactory might be worthwhile.

34. What is important, whether distribution is through governmental, cooperative, or private channels, is that there be no gaps in the system from importation or manufacture to village outlets within easy reach of farm operators. Manufacture, transportation, storage, and village retailing all must be articulated whether handled by the same or by different agencies. And at the village end of the supply line the amounts of various requisites stocked must be related to the recommendations of extension or other farm advisory services.

Production Credit

35. Even if locally-adapted combinations of improved practices are available, farmers are ready to adopt them, and the necessary requisites are at hand, the purchase of requisites still has to be financed. In some cases this can be done from savings. In others it will be necessary to borrow.

36. It is widely believed that new agencies to make production credit available to farmers are a necessity in the early transitional stages of agricultural development. Several recent studies have indicated that even though interest rates are high, lack of special credit facilities may not stand in the way of the purchase of production requisites provided tested practices that offer attractive prospects of increased income are available and that requisites of proved effectiveness are for sale at fair prices. This is not to say that improved credit facilities are not desirable and needed. It does point to the fact that the first requirement is for improved practices that produce results and the requisites necessary to put them into effect. The failure of farmers to adopt improved practices on a wide scale is often ascribed to lack of organized credit facilities when the real reasons lie deeper.

37. Although lack of credit on favorable terms may not be a barrier to agricultural development, it is clear that a well-organized credit system that functions effectively -- whether private, cooperative, governmental or a combination of the three -- greatly facilitates development. More and more credit is used and credit therefore becomes increasingly important as agriculture moves from the traditional through the transitional into the commercial stage of development.

38. In the early stages of development, lenders usually rely heavily upon pledged collateral or the reputation of borrowers as security for their loans. This penalizes the farmer without collateral but who is progressive and capable of repaying a loan from the production of his farm. An important first step in developing an effective production credit system is to begin to make loans based on an analysis of the borrower's ability to repay his loan from increased farm income rather than the possible liquidation of pledged collateral.

39. A second important step is to adjust the term of the loan to the normal production and marketing cycle. Production loans should not fall due until a reasonable period after the marketable product is in hand. Otherwise the borrower is placed in a position where the lender can bring pressure upon him to sell immediately at harvest time when prices are often low, perhaps to the lender or someone he designates. This works to the disadvantage of the farmer, decreases his incentive to borrow to increase production and works counter to programs to encourage orderly marketing.

40. Like any other production requisite, credit must be available when needed if it is to influence farmers' production decisions. A loan applied for on March 15 and approved May 1 to finance a crop that must be planted not later than April 10 is not likely to speed the adoption of improved practices.

41. Cost is a factor affecting farmers' use of credit just as cost affects their use of other production goods and services. As previously indicated, however, the cost of credit may not be the critical factor determining the extent of its use. This being the case, the question of whether or not to subsidize interest rates and if so to what extent is a matter for careful analysis and consideration.

Inducing Farmers to Adopt Improved Practices 1/

42. In most countries the individual farm operator, whether owner, tenant or hired manager, is the key decision-maker in agriculture. If improved practices are to be adopted he must be trained to use and persuaded to adopt them.

1/ We have drawn extensively upon an unpublished memorandum prepared by Dorris D. Brown, Agricultural Economist, The Ford Foundation, New Delhi, in the preparation of this section.

43. Observations in a number of countries in which agriculture is in the early stages of transition, suggest that within the limits of their knowledge and the alternatives open to them farmers in these countries are as rational in their economic decisions as farmers anywhere. They respond to price differences. They are affected by the share of the harvest they can retain. They operate within the limits of their knowledge. They also respond, of course, to the prevailing social values of the groups in which they live.

44. In most newly developing countries illiteracy in rural areas is high, ranging from 60 to 90 per cent or even higher. This does not mean that farmers lack intelligence. It does mean that their knowledge of underlying factors affecting plant and animal production is limited as is their ability to calculate probable costs and returns as a basis for selecting from among a number of alternatives. A recent Indian survey reports that the number of improved practices adopted by individual farmers was directly and significantly related to levels of educational attainment. This suggests that although it may not be too difficult to get farmers to adopt a single, simple practice in areas where illiteracy is high, achieving widespread adoption of combinations of improved practices may prove to be slow, at least in the beginning. It will become easier and more rapid as farmers become, first, literate, and then better and better educated, and as extension and research personnel become more and more competent.

45. There are three important means by which change to improved farm practices can be accelerated. One of these is the type of education usually associated with the term extension education. A second way to provide greater inducements to farmers to adopt improved practices is to protect them against undue economic risks of innovation by establishing price floors for important agricultural products so that they need not fear disastrous price declines as production increases. A third way is to devise conditions of tenure and tenancy that assure farmers of reasonable security of tenure and a fair share of such increases in production as may result from the adoption of improved practices. At the same time, these arrangements need to be such as will encourage land improvements and other medium- and long-term types of capital investment by landowners. Tenant farmers who receive only 50 to 60 per cent of the added yield and must pay all the added cash costs may not feel they are likely to gain enough from adopting improved practices to justify the risks involved.

46. Research and advisory services in many developing countries are not such as to win the confidence of farmers. Research workers, few of whom have a farm backgound, spend a large part of their time in laboratories or central research stations and little time in the field. They have little first-hand knowledge of production and related economic problems confronting farmers and contribute little toward their solution. Advisory services are frequently understaffed, often at the village and farm level by persons without farming experience and only limited technical knowledge gained in training courses extending over periods of six months to two years. Acting under instructions from above, they can tell farmers what to do but seldom can they tell them why or show them how. Few are competent to advise individual farmers how to adjust recommended combinations of practices to fit their particular situations or help them develop medium- or long-term farm plans based upon estimated costs and returns from several alternative possibilities. Because communication with research scientists is usually irregular and poor, members of advisory services seldom can be of help in dealing with new and unexpected problems.

47. Yet, despite all of the handicaps confronting them, some village-level workers and farm advisers do surprisingly well. An important problem in the early stages of developing an advisory service is bringing the performance of the many to the standards of the best, at the same time seeking to raise the general level of technical knowledge and competence.

A Strategy for Agricultural Development

48. Obviously, a comprehensive strategy for agricultural development in a newly developing country must be much broader than the needs discussed in this paper. Such a comprehensive strategy must include attention to optimum investment in roads and transport, improvement of arrangements for marketing farm products, measures for public health and general education, determination of appropriate patterns of land tenure and taxation, and to many other aspects of the total economy.

49. The burden of this paper is to high light the activities most essential to improving managerial decision-making and husbandry practices by individual farm operators, and to urge the absolute necessity of the coordination of these at the local level. Far too frequently, the all-important local testing of single improved practices and of combinations of these receives little or no attention. Extension education is frequently uncoordinated with local testing, with the production and distribution of requisites, and with production credit.

50. We suggest that the obvious starting point in coordinating these activities in each agricultural area is in the arrangements made for local testing and for extension education. Widespread demonstrations of the results of local testing can be an effective addition to extension practices.

51. To this basic combination of local testing and extension there must be added adequate provision for the supply and financing of production requisites. These are sufficiently different from local testing and extension education that they are usually best handled by separate staffs. But close coordination between these and extension education and local testing is imperative. This can be achieved within each agricultural area by making those responsible for all of these activities locally responsible to a single local administrator of agricultural development.

52. Each newly developing country faces a seeming conflict between economic considerations, on the one hand, and social and political considerations, on the other, in its program for agricultural development. Economic considerations argue for concentration of scarce resources, including skilled manpower, on increasing agricultural production in those regions where both natural and cultural factors are most favorable. Social and political considerations frequently argue for spreading development resources fairly evenly over the whole rural population.

53. The conflict between these may be more apparent than real. For what is imperative in the first instance is to find and develop a pattern of local coordination of the activities necessary to improve managerial decision-making and husbandry practices by individual farm operators. Except, perhaps, in the case of very small countries, this cannot be done on a nationwide basis in the first instance; it must be done first in a few selected areas. In view of the economic consideration of increasing total agricultural output as rapidly as possible, these first experiments in adequately supported and coordinated local programs should be in areas where natural and cultural circumstances are most favorable. A pattern of operations, once determined, tested and established, can then be spread as rapidly as resources (particularly of trained manpower) will permit, to more and more regions of less and less initial agricultural potential, until the social and political considerations, which are of equal importance in the long run, are satisfied.

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